



RIDER D – ACCEPTANCE TESTING

1. General

- (a) Acceptance test shall be conducted by CalPERS staff for each system component certified by the Contractor as ready for operational use.
- (b) Acceptance test shall begin when the Contractor certifies a system component is ready for operational use and all deliverables as described in Rider I have been completed and approved by CalPERS. Acceptance Tests shall be conducted to ensure that the production hardware, software, business processes, and system interfaces are of sufficient quality for the deployment of the system component. Each Acceptance Test shall end when CalPERS provides written acceptance of the system component.
- (c) Each Acceptance Test shall consist of five criteria; (1) a System Reliability Test, (2) a Performance (Load and Stress) Test, (3) a System Functionality Test, (4) a System Quality (Defects) Test, and (5) Data Conversion Verification Test. Each test is described below in Sections four (4) through eight (8) and must be provided for in the Contractor's Acceptance Test Plan. An Acceptance Test shall be determined successful when all Acceptance Test standards criteria are completed and approved by CalPERS for a system component.
- (d) The Contractor shall provide qualified personnel, including but not limited to designers, implementers, systems developers and testers, to assist CalPERS as required during the Acceptance Test period at the sites defined in Rider F.

2. Test Criteria and Standards

- (a) Prior to CalPERS commencing system component Acceptance Test, Contractor must sufficiently demonstrate to CalPERS that the system component is ready for Acceptance Test. CalPERS will approve the commencement of Acceptance Test only after all Development Testing identified in the Project Plan such as Unit Testing, System Integration, and Data Conversion Testing has been completed and documentation of such testing has been provided and approved by CalPERS.
- (b) For each Acceptance Test, equipment or software shall not be accepted by CalPERS and no charges will be paid by CalPERS in accordance with this Agreement until the standards of reliability, performance, and system quality are met for that Acceptance Test.
- (c) The system component Acceptance Test will be deemed successful if the system operates at a minimum, at the reliability, performance, functionality and system quality levels specified in the success criteria for a period of time, no less than 45 days, or as agreed upon by Contractor and CalPERS within the testing



plan defined in Rider I. The Acceptance Test period will begin with CalPERS accepting the system component as ready for Acceptance Test.

- (d) If during the Acceptance Test period the solution fails to meet sufficient standards of quality, reliability or performance as decided upon by CalPERS then the Acceptance Test period may be restarted at Day Zero of the agreed upon Acceptance Test period or any day thereafter.
- (e) As system defects are identified, CalPERS may, at its discretion, restart the Acceptance Test period clock. If CalPERS exercises this right, the Acceptance Test period clock may be reset to Day Zero or any other day thereafter as decided by CalPERS. This will in effect lengthen the time that the system component is available to CalPERS for Acceptance Test.
- (f) Upon successful completion of Acceptance Test, CalPERS shall notify the Contractor in writing of acceptance of the system component. For licensed software where the Contractor administers the license, the license is to begin on the day CalPERS notifies the Contractor of acceptance of the system component that utilizes the software controlled by that license. Where there is a conflict between provisions in Rider D and standard licenses of third party commercial products listed in Riders B and C, the third party license shall prevail. However, nothing in this provision shall relieve Contractor from its obligations under this Agreement.
- (g) All software developed or provided under this contract that is accepted shall be delivered to CalPERS.

3. Maintenance During Acceptance Testing

During Acceptance Tests, all planned (scheduled) maintenance shall be performed during off operational hours or at a time of low workload as approved in advance by CalPERS. All maintenance, service, and parts shall be furnished by Contractor without charge during the period of Acceptance Testing on the same basis as set forth in Rider F unless such maintenance, service, and parts are required as a result of the fault or negligence of CalPERS.

4. System Reliability Test

- (a) Reliability testing is the discipline of measuring a system's availability to operate as expected or as designed. Reliability is related to availability, and can be expressed numerically as the percentage of time that the measured component or system is available for use.
- (b) $\text{Percentage of Availability} = (\text{Total Elapsed Time} - \text{Sum of Down Time}) / \text{Total Elapsed Time}$. These terms are defined in Table D.1 below.



Availability Term	Definition
Percentage of Availability	Percentage of Availability is the percentage of time that a component or system is available to perform the expected functionality as designed. Technical Requirement T-109 states a need to provide a 99.5% availability.
Total Elapsed Time	Total Elapsed Time equates to the amount of time the system was being tested less any unplanned outages that were not the responsibility of the Contractor. Contractor planned non-available time shall not be included in the test, but shall be reported to CalPERS to validate planned non-availability.
Sum of Down Time	Sum of Down Time is the amount of time for which a measured component or system is unavailable to perform the expected functionality as designed. Unplanned, non-available time shall be measured by those intervals during the Acceptance Test period between the time that the Contractor is notified of a system failure and the time that the Contractor reports that the failing component is returned to a fully operational condition.

Table D.1 Definition of Availability Terms

- (c) CalPERS will rely heavily on statistics provided by the application, operating system, and network logs. This information is used to analyze the availability of the systems and components as they are tested and made ready for production. Once in production the accepted components will continue to be monitored and analyzed for reliability.
- (d) Software defects affecting only a specific function within the system business component will not be considered as unavailable for purposes of this System Reliability Test. The software defect will be recorded, assigned a severity level, and tracked according to the process defined in paragraph 7, System Quality (Defects) Test.
- (e) Availability shall be measured for each system component including physical devices (workstation, printer, server, et al) and each critical software program (operating system, application, and Database Management System (DBMS), et al) for which the Contractor is responsible.
- (f) The System Reliability Test shall be determined successful at the end of the project provided the Percentage of Availability is at least equal to the availability specified in the Technical Requirement T-109.
- (g) System Reliability Testing will be performed throughout the entire life cycle of the project starting at the commencement of the first component to be delivered ending at the acceptance of the final PSR system.



5. Performance (Load and Stress) Test

CalPERS will evaluate the system performance using the following process or by a process approved by CalPERS:

- (a) Performance evaluation shall be used to determine that the system component meets response times that are acceptable to CalPERS. Maximum response times are outlined in Table D.2. Successful performance evaluation shall be determined by comparing the actual response times for the system component identified during the Acceptance Test phase to the expected response times outlined in Table D.2.
- (b) Where appropriate, separate response time expectations and metrics will be applied for online and batch processes. These response time expectations are listed separately where appropriate in Table D.2.
- (c) CalPERS understands that the Contractor cannot be held responsible for response time delays outside of Contractor's control.
- (d) In determining the actual response time metrics in paragraph 5(a) above, it is understood and agreed that the performance tests conducted shall test the system response time capabilities under peak load. The Contractor is responsible for converting and loading all data needed for Performance Testing, providing and operating the data loading mechanism, and estimating CalPERS peak loads in advance of the test. The Contractor must receive CalPERS approval of peak load estimates.
- (e) CalPERS reserves the right to create data to be used in the performance testing that simulate possible error conditions.



Measured Area	Expected Performance
Online Display Screens	95% in 3 seconds, nothing to exceed 10 seconds
Online Record Updates	95% in 3 seconds, nothing to exceed 10 seconds
Online Browsers/Selections	95% in 30 seconds, nothing to exceed 3 minutes
Scheduled Batch Processing	All nightly scheduled batch processing must be able to be completed in the agreed upon nightly batch window.
Online initiated Batch Reports	Printing must begin within 5 minutes of submission.
Online initiated Mass Updates	Mass update must complete within 5 minutes of submission.
Network	Allowances will be made for unsatisfactory performance due to network related issues that are beyond the Contractor's control.

Table D.2 Expected Response Times**6. System Functionality Test**

- (a) CalPERS will evaluate the system component's ability to meet the business needs of CalPERS business area staff. This testing is required to validate the ability of the new solution to meet the business requirements in a user-friendly and efficient manner. This testing will be conducted using business test scenarios and business test cases create by CalPERS and Contractor to simulate the different types of transactions expected within each CalPERS business area.
- (b) The System Functionality Test shall be determined successful when the system component successfully passes all business test scenarios and business test cases with no outstanding defects beyond those defined as successful within criteria defined within Paragraph 7, System Quality (Defects) Test.
- (c) System defects discovered during this test will be tracked in a defect log and assigned a severity level as per the criteria specified in Table D.3.



Severity Level	Severity Description	Example	Expected Response Time
1	Any disruption in service that has a major business or job impact affecting multiple users or customers where there are no acceptable alternative methods by which the function can be performed.	Major Component of Solution is not working. Defects causing data corruption.	0 – 2 business hours
2	Any disruption in service which has a major business or job impact affecting multiple users or customers where there are acceptable alternative methods to perform the disrupted functions.	Several Screens within the solution are not working but other avenues are available to perform the same task, albeit, less conveniently.	0-4 business hours
3	Any disruption in service that has a minor business or job impact affecting multiple users or customers where those people affected are still able to perform their functions.	A degradation of system performance.	0-12 business hours
4	Any other disruption of service or problem discovered within the solution.	Incorrect Screen Design Standards	0 – 48 business hours

Table D.3 PSR Application Software Severity Level Definitions

- (d) During the Acceptance Test period, CalPERS agrees to use the PSR System substantially within CalPERS accepted operating guidelines as provided by Contractor.

7. System Quality (Defects) Test

- (a) CalPERS will evaluate the quality of the system component by reviewing the identified and uncorrected system defects that exist at the end of the Acceptance Test period. The defects reviewed will include all known defects within the system component being acceptance tested, not just those defects found during the Acceptance Test period.
- (b) All defects identified for the system component during all testing efforts will be recorded and assigned a severity level as per the criteria specified in Table D.3. These defects will be tracked until they have been retested and determined by CalPERS to be corrected.
- (c) The successful outcome of the System Quality Test will be determined by comparing the total number of outstanding defects per severity to the number of allowed system defects for each severity level as defined below in Table D.4.



- (d) The System Quality (Defects) Test will be determined successful provided the actual numbers of defects identified for the system component are not more than defined in Table D.4.

Severity Level	Maximum Number of Acceptable Defects	Comments
1	None	All Severity 1 defects must be corrected and fully tested before implementation can be considered.
2	Maximum of 3 allowed Defects causing data corruption are not acceptable.	Individual circumstances surrounding the defect must be reviewed to determine that it is indeed reasonable to deploy the system component. There must be a CalPERS approved plan to correct the defect immediately upon entering production.
3	Less than 20 Defects causing data corruption are not acceptable.	There must be a CalPERS approved plan to correct the defects after entering production.
4	Less than 150 Defects causing data corruption are not acceptable.	There must be a CalPERS approved plan to correct the defects after entering production.

Table D.4 System Quality Acceptance Criteria

8. Data Conversion Verification Test

- (a) CalPERS will evaluate the quality of all converted data provided by Contractor prior to deployment of this data.
- (b) Data Conversion scope is identified in the Data Conversion Plan (DCP) identified as a deliverable in Rider I. This scope will form the basis of determining which data should be converted.
- (c) CalPERS will perform Data Conversion Verification testing by using a series of planned ad-hoc sampling, as well as developing data analysis programs. These programs will compare details of certain data in the legacy system against the results of similar analysis programs executed against the new solution. All differences should be explained as either a data conversion defect or some other identifiable reason such as out of scope.
- (d) Ad-hoc sample records will be selected based on previously identified patterns. These records will be viewed using the existing legacy system(s) and compared against the same record viewed in the new system solution. Variances will be tracked for analysis by Contractor to identify patterns that require a change to the data conversion models. Contractor must estimate the number of potential records affected by all identified data conversion defects.



- (e) Contractor is responsible for providing evidence of corrected data conversion defects to CalPERS.
- (f) The Data Conversion Verification acceptance criteria are identified in Table D.5. CalPERS will assign all Data Conversion defects a defect type as defined in Table D.5.

Data Conversion Defect Type	Description of Defect Type	Maximum Acceptable % of Records with Defects
Minor	Record is converted but contains minor defects. These defects do not prevent the converted record from being used in automatic or manual processing.	1.5 %
Major	Record can be converted, but contains major defects. The record cannot be used for automatic processing but can be used for manual processing. These records must be identified to prevent being used in automatic processing.	0.5 %
Fallout	Record cannot be converted at all. A list of all these records must be provided as part of the data conversion process.	0.25 %

Table D.5 Data Conversion Defect Types

- (g) For situations where corrupt data is found to be the cause of the problem, Contractor and CalPERS will work together to decide on the best course of action to correct the defect. It is recognized that some corrupt data may be best cleaned up within the legacy system using a manual intensive effort rather than applying an automated fix, but even in these cases the corrupt data must first be identified, often using automated data analysis tools.
- (h) For each data conversion defect the following details must be tracked: (1) defect type, (2) estimated number of records affected, (3) system component function impacted by unconverted records, (4) source of non-converted records. Sources of the data conversion defect may include such things as defective data conversion modeling or programming logic, as well as corrupt data.
- (i) The successful outcome of the Data Conversion Verification Testing will be determined by comparing the percentage of the total population of in-scope data conversion records with defects for each Data Conversion Defect type.